REMARKS

I. Formal Matters

Claims 1-35 are currently pending in this application. Applicant thanks the Examiner for acknowledging the claim to foreign priority under 35 U.S.C. §119 and for confirming receipt of the certified copy of the priority document. In addition, Applicant thanks the Examiner for initialing the references listed on Form PTO-1449 submitted with the Information Disclosure Statement (IDS) filed on July 1, 2003.

II. Specification

The Examiner objects to the title as being non-descriptive. The title has been amended as shown in AMENDMENTS to the SPECIFICATION. Applicant respectfully submits that the title should not be construed to limit the scope of the claims. Minor corrections to the specification text are submitted in AMENDMENTS to the SPECIFICATION as requested by the Examiner.

III. Claims

Dependent claims 3, 14 and 27 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite. The subject matter of claims 3, 14 and 27 has been incorporated into their respective independent claims 1, 12 and 25 to more particularly point out and distinctly claim

Applicant's invention. Dependent claims 3, 14 and 27 have been amended to claim subject matter previously disclosed. Accordingly, withdrawal of this rejection is respectfully requested.

Independent claims 1, 12 and 25 are rejected under 35 U.S.C. §102(b) as being anticipated by *Raaijmakers et al.*, U.S. Patent Publication No. US 2001/0024387 A1 (*Raaijmakers*). The Examiner asserts that *Raaijmakers* discloses an atomic layer deposition (ALD) method for forming a tantalum oxide layer and alleges that said method includes all of the limitations set forth in Applicant's independent claims. *Raaijmakers* discloses some complications and shortcomings of "CVD" (chemical vapor deposition) ([0013]) and then goes on to describe his invention method employing "alternately adsorbing self-terminated...monolayers through ligand exchange reactions" ([0021]), termed "atomic layer deposition (ALD)" ([0044]). *Raaijmakers* discloses a method for creating a film one monolayer, one molecular layer, at a time through ligand exchange reactions. A finite number of binding sites exist on a substrate to which a first species may form chemical bonds; thus, these layer formations are self-limiting and are monolayers. In turn, a finite number of binding sites exist for a second reactant species. *Raaijmakers*' methods comprise cycles of alternating reactant steps, wherein each step is self-limiting and contains only one reactant species ([0021]; Figs. 4 and 5). This is clearly shown in Fig. 5 (*Raaijmakers*).

In contrast, Applicant claims a method wherein both a material gas (first species) and an oxidizing gas (second species) are introduced into the reaction chamber during a first stage (step) (claims 1, 12 and 25). Further, the reaction temperature is selected such that the reaction of the

material gas (first species) will not be self-limiting, and will not bind only to the finite number of binding sites on the substrate (claims 1, 12 and 25). Applicant submits that at least because *Raaijmakers* fails to disclose the step of introducing both a material gas (first species) and an oxidizing gas (second species) simultaneously and because Applicant specifically limits his claims to non-self-limiting reactions, the §102(b) rejection by *Raaijmakers* should be withdrawn.

Further, dependent claims 2-4, 6, 8-11, 13-15, 17, 19-24, 26-28, 30 and 32-35 are asserted to be in condition for allowance as depending from allowable independent claims.

Independent claims 1, 12 and 25 are rejected as allegedly being anticipated by *Derderian,* U.S. Patent Publication No. US 2002/0025628 A1 under 35 U.S.C. §102(b) (*Derderian*). More specifically, the Examiner cites to *Derderian* at paragraph [0034] as disclosing "...an atomic layer deposition method for forming an aluminum oxide layer..." In his detailed description of preferred embodiments, *Derderian* discloses that "[t]he first species is purged from over the substrate and a second chemical species is provided to chemisorb onto the first monolayer of the first species." ([0021].)

In contrast, Applicant claims a method where a first chemical species (material gas) and a second chemical species (oxidizing gas) are introduced simultaneously into the reaction chamber.

Derderian describes ALD has having a " chemisorption rate" influenced by substrate composition and structure [0024] whereas, "...under most CVD [chemical vapor deposition]

conditions, deposition occurs largely independent of the composition or surface properties of the underlying substrate." [0024]. *Derderian* describes his invention as "...chemisorbing a first precursor...and chemisorbing a second precursor..." [0030]. *Derderian* cautions "...operating outside the traditional [ALD] temperature and pressure ranges may risk formation of defective monolayers." [0023]. *Derderian* discloses and claims a method of chemisorption associated with an ALD process.

In contrast, Applicant claims a method wherein both a material gas (first species) and an oxidizing gas (second species) are introduced into the reaction chamber simultaneously during a first stage step (claims 1, 12 and 25). Further, the reaction temperature is selected such that the reaction of the material gas (first species) will not be self-limiting, and will not bind only to the finite number of binding sites on the substrate (*Applicant's* claims 1, 12 and 25; *Derderian* [0023]). Applicant submits that at least because *Derderian* fails to disclose the step of introducing both a material gas (first species) and an oxidizing gas (second species) simultaneously and because Applicant specifically limits his claims to non-self-limiting reactions, that the §102(b) anticipation by *Derderian* rejection should be withdrawn.

Dependent claims 2-3, 6-7, 10, 13-14, 17-18, 21, 23-27, 30-31 and 34 are asserted to be in condition for allowance as depending directly, or indirectly, from allowable independent claims 1, 12 and 25.

Independent claims 1, 12 and 25 are rejected as allegedly being anticipated by *Haukka,* U.S. Patent Publication No. US 2002/0115252 A1 under 35 U.S.C. §102(e) (*Haukka*). Like *Raaijmakers*, *Haukka* discloses and claims an atomic layer deposition method. Exemplary language in *Haukka* is found in paragraph [0066]. "The self-saturating surface reaction leaves a hydroxyl terminated aluminum oxide layer on the substrate surface..." All reactions disclosed by *Haukka* are self-limiting surface reactions. Additionally, *Haukka* introduces one reactant at a time into the reaction chamber. For example, trimethyl aluminum (TMA) and H_2O reactant pulses are alternated ([0066]; Fig. 2).

In contrast, Applicant claims a method wherein both a material gas (first reactant) and an oxidizing gas (second reactant) are introduced into the reaction chamber simultaneously during a first stage step (claims 1, 12 and 25). Further, the reaction temperature is selected such that the reaction of the material gas (first species) will not be self-limiting, and will not bind only to the finite number of binding sites on the substrate (*Applicant's* claims 1, 12 and 25; in *contrast to Haukka* [0066]). Applicant submits that at least because *Haukka* fails to disclose the step of introducing both a material gas (first reactant) and an oxidizing gas (second reactant) simultaneously and because Applicant specifically limits his claims to non-self-limiting reactions, the §102(b) rejection over *Haukka* should be withdrawn.

Additionally, withdrawal of the §102(e) rejection by *Haukka* of dependent claims 2, 4-6, 10-11, 13, 15-17, 21-22, 26, 28-30 and 34 is believed to be in order as said claims depend, either directly or indirectly, from allowable independent claims 1, 12 and 25.

IV. Closing Remarks

In view of the preceding amendments and remarks, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If there are any points remaining in issue that the Examiner feels may be best resolved through a personal or telephonic interview, Applicants kindly request him to contact the undersigned attorney at the local telephone number listed below.

The USPTO is directed and authorized to charge all required fees (except the Issue/Publication Fees) to our Deposit Account No. 19-4880. Please also credit any over-payments to said Deposit Account.

Respectfully submitted,

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